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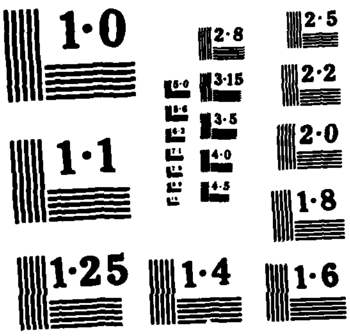

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TITLE

Elastic and Inelastic Light
Scattering of Colloidal Particles

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Potsdam, New York 13676

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silver hydrosols, silver organosols and roughened silver electrodes, the effect of aggregates on SERS.

In addition there have been ancillary studies dealing with absorption and luminescence by dye coated silver particles, analysis of biological cells by flow fluorimetry, and electromagnetic scattering by magnetic particles.

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The view, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Light Scattering	Raman Scattering
Fluorescence	(Surface Enhanced Raman Scattering)
Luminescence	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The project has been primarily concerned with both theoretical and experimental aspects of surface enhanced scattering. The theory has been extended to include concentric spherical particles, the effect of surface coverage, enhancement of coherent anti-Stokes Raman scattering and the effect of dielectric cavities. The experimental work included SERS from citrate on silver hydrosols, surface enhanced resonance Raman scattering (SERRS) for dabsylaspartate on

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Statement of Problem Studied:

The studies carried out during the period of this grant have responded mainly to the query: How is the Raman or fluorescent scattering affected when the active molecules are embedded within dielectric particles or are adsorbed at the outer surface of either dielectric or metallic particles.

Summary of Most Important Results:

The large enhancement of Raman signals from molecules adsorbed at the surface of colloidal silver occurs because of the resonant excitation of surface plasmons at particular excitation frequencies. These resonant effects depend upon both the dielectric properties of the material and the size and morphology of the particles. Silver is particularly effective because of its dielectric properties. We have shown how a partially coagulated system the excitation profile for SERS shifts with extent of coagulation in agreement with the above notion. By utilizing a chromophoric molecule such as dabsyl aspartate we have been able to obtain an overlap of the resonance Raman effect and the surface enhancement effect giving rise to SERRS. Then by utilizing a AG organosol or a roughened silver electrode, it has been possible to decouple the two effects giving rise to observation on the same surface of SERS and surface resonance Raman scattering SRRS.

Detailed results may be found in the 24 published papers listed below.

List of Publications:

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